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THE OHIO STATE UNIVERSITY
COLLEGE OF EDUCATION
GEORGE F. ARPS, *Dean*

TEACHING AS A FINE ART

THE above slogan will determine the character of the Eighth Annual Ohio State Educational Conference which the College of Education, Ohio State University, will conduct at Columbus on April 12, 13, and 14, 1928.

With the slogan selected and the dates announced, the Executive Committee is now engaged in the construction of the programs for the forty-odd meetings held annually during the three-day session.

Information concerning the Conference for 1928 may be obtained by addressing George F. Arps, Dean of the College of Education, Ohio State University.

April 12, 13, and 14, 1928 *Reserve the dates*

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Educational Research Bulletin

SCHOOL ARCHITECTURAL SERVICE

WARD G. REEDER
Ohio State University

AFTER the decision has been made to erect a school building or to rehabilitate an old one, the next task of the school administrative officers is to select an architect for the project. It is the architect's function to synthesize the recommendations of the construction engineers on the one hand and the desires of the educational experts on the other hand.

Upon the architect depends more than upon any other individual the merit of the building. He determines more than any other person whether the building will be a beautiful or an unattractive creation, whether it will meet the needs of a modern educational program, whether it will be safe and sanitary, and whether it will be economically arranged and otherwise well constructed. Therefore, school officials are under obligation to select the best architects for the money available. The day when anyone—a school-board member, a teacher, or a carpenter—could design a school building belongs to the bygones; school architecture is today a profession.

The preamble of "the principles of professional ethics and the canons of ethics of the American Institute of Architects" states the importance of the work of the architect and the general qualifications which an architect should have as follows:

> The profession of architecture calls for men of the highest integrity, business capacity, and artistic ability. The architect is intrusted with financial undertakings in which his honesty of purpose must be above suspicion; he acts as professional advisor to his client and his advice must be absolutely disinterested; he is charged with the exercise of judicial functions as between client and contractors and must act with entire impartiality; he has moral responsibilities to his professional associates and subordinates; finally, he is engaged in a profession which carries with it grave responsibilities to the public. These duties and responsibilities cannot be properly discharged unless motives, conduct, and ability are such as to command respect and confidence.

A school architect, writing anonymously, says of the school architect and his profession:

> Architecture is an art, grounded in the science of building, and the practice of architecture is a profession; and no man can be called an architect who lacks the instincts of the professional man.
>
> What are the instincts that should distinguish the architect as a professional man? I like to think it is not merely the white collar and clean hands of the various professional callings that attract our high-school and college boys, but rather the challenge to service through special ability and high skill. Be that as it may, a professional man is one who professes that special ability and skill, and who invites opportunities of personal service thereby and expects to be remunerated personally in proportion to his service. Do not miss the point that his service is direct and personal, for this distinguishes him from the business man, and if one may say it—personal contact subjects his attitude and dealings to a gentler and finer standard than is current in the strictly business world. This is peculiarly the case with the architect, whose profession it is to refine and beautify with art, and perfect with science, the varied shelters of our lives and occupations. And when, as in school work, there comes the privilege of bringing this art and science to the service of children, and through them to society and the home-land, the attitude

1912.

of the architect may well be one of sincere devotion in which considerations of the main chance are merely secondary or entirely in the background. Not that the architect may be ignorant of the business of building, or ignore his personal business relations—but that his main thought is centered upon the creation for which alone these exist.[1]

The school architect should have two major qualifications. In the first place, he should have a knowledge of architecture. In the second place, he should have a knowledge of education; indeed, if he knows *school* architecture, he will have a knowledge of education. He should have an understanding of, and a sympathy with, the aims of education, and he should know how to design a building that will further the accomplishment of those aims. Whether or not an architect has these qualifications may be ascertained by inspecting some of the buildings which he has constructed, and by inquiring of school officials for whom he has done architectural work.

At this point we want to emphasize the necessity for a careful checking of the architect's plans and proposals by the superintendent of schools, the board of education, the members of the building department, if there be such, and other members of the professional staff. It is the duty and the desire of the architect to give the community the type of building that best meets the needs of the community; stereotyped plans—plans that have been made for use in other communities—although they may be suggestive, will not suffice. Of course, the architect is the professional advisor to the school authorities, and he should therefore be frank in criticising any of their proposals. He should not, because of fear of offending and of losing "business," accept a suggestion when he knows the suggestion to be a bad one. The way to secure a modern building is to *design* it that way. Too many school buildings have been designed in an amateurish way. Too many features have had to be arranged for as "afterthoughts," if they were to be included at all. Too much absurd ornamentation has been provided in the name of beauty and too much space has been wasted. Eternal vigilance on the part of both the architect and the school officials is one of the prices of a well designed school building.

[1] "Let the Architect Beware," *American School Board Journal*, 70:49-50, January, 1925.

PLANS FOR SECURING ARCHITECTURAL SERVICES

In a recent exhaustive investigation of the plans which cities have provided for the administration of school architectural service, five general plans were found to be in use.[2] A brief description of each of these plans is given herewith:

1. *A separate architect for each building.*—Under this plan the architect is held entirely responsible for the completion of his building. He develops all plans and specifications, inspects all materials, supervises construction, and approves the acceptance of the building from the contractor by the board of education. For his services, he is paid a fee, amounting usually to 6 percent of the cost of the building.

This plan is by far the most common of any. It is used everywhere in the smaller cities and in the rural communities. Since it is used primarily in the smaller school districts in which there cannot be maintained a large administrative organization, the architect usually works under the immediate direction of the superintendent of schools or the board of education. In the larger communities, in which a larger administrative organization is possible, the business manager of the schools or an assistant superintendent of schools is frequently placed in charge of the building program and has general supervision of the architects. Denver, Colorado, is an example of a community

[2] Hull, O. R. "The Administration of School Building Programs," *American School Board Journal*, 73:53-56, 170-73, July, 1926.

that has recently engaged in a large school-building program on the latter basis.[1] Under this plan, boards of education frequently hire an additional supervisor of construction at their own expense. This inspector generally works on a salary basis.

2. *A supervising architect.*—Under this plan the board of education employs a supervising architect who is expected to have general supervision of the project architects. The supervising architect provides preliminary plans and standard specifications for the project architects, and the latter, in turn, under the direction of the supervising architect, are responsible for working out of all details and for the completion of the projects.

This plan has the advantage of distributing the school patronage, and of bringing into school architecture the ideas of many architects. Moreover, the supervising architect is in a position to provide for a continuity of standards in the plans and specifications; for example, working with the educational staff, he can develop unit plans and layouts which may be used throughout the school system.

The plan is used particularly in communities which have a large though a short and intensive building program. Such communities often feel that they cannot afford to establish an expensive building organization of a permanent nature. Atlanta, Georgia, which recently engaged in a large school-building program, followed this plan. In that city the cost of the architectural organization was 6 percent, distributed thus: to the project architect, 4.5 percent; to the supervising architect, 1 percent; and to the school-housing and school-program expert, 0.5 percent.[2]

3. *A combination of plans 1 and 2.*—A supervising architect and project architects are employed on a commission basis such as described in plans 1 and 2. However, in this plan, unlike the first and second plans, the project architects are relieved of all responsibility of supervision and inspection of construction. Of course, the architect may give such supervision and inspection as he sees fit, but such as he gives is merely advisory and no pay is given for it. The plan is also used by communities large enough to maintain a supervising architectural staff as well as the necessary construction inspectors and supervisors. It gives a continuity and a coordination to the school-building efforts of the community, often assures better supervision, and in many instances is more economical. The usual fee of architects is 6 percent, 4 percent of which is given for designing plans and specifications, and 2 percent for supervision and inspection of construction. The board of education, under this plan, employs its supervisors and inspectors on a salary basis. Los Angeles, California, is an example of a city that has its building department organized on this basis.

4. *A complete school-building organization.*—The community maintains, on a salary basis, a complete organization for the construction of school buildings, which organization plans buildings and supervises and inspects the construction of them. It is obvious that this arrangement is feasible only in communities which always have a considerable amount of repair work and construction under way. Philadelphia and Cleveland, Ohio, are examples of cities that use the plan. Philadelphia secures her architectural service at an average charge of 1.3 percent.[3] Compared with the usual charge of 6 percent, this appears to be a large saving, but, as will be shown later, this apparent economy may be fictitious.

In Philadelphia, plans are prepared according to standard specifications and

[1] For a description of the Denver plan, *see* Hull, O. R., "The Administration of School Building Programs," *American School Board Journal*, 72:61–62, June, 1926.

[2] *Ibid.*, p. 61.

[3] Bruce, W. G. "Securing School Architectural Service," *American School Board Journal*, 68:84, January, 1924.

layouts of the superintendent of schools and his educational staff. Moreover, before any plans can be placed in execution, they must be approved by the superintendent of schools, who is now aided in giving this supervision by an assistant superintendent. Such approval on the part of the educational staff is essential, if provision for the educational interests is not to be neglected, for the planning of a school building is primarily an educational function.

5. *The associated architects.*—Under this plan which is used now, so far as is known, only by Niagara Falls, New York, the board of education enters into an agreement with the local architects who organize as an association. Such association then selects the architect who is to be responsible for planning the project under the general supervision of the association. Buffalo, New York, one of the few cities that has tried the plan, recently gave it up because of a feeling that responsibility could not be placed in a group or in an association.

TABLE I

DISTRIBUTION OF TYPES OF ADMINISTRATIVE ORGANIZATION BY POPULATION OF CITIES

Population	Type					Total Cities
	1	2	3	4	5	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
More than 1,000,000...	0	0	0	3	0	3
500,000 to 1,000,000....	4	1	1	3	1	10
100,000 to 500,000.....	23	4	1	7	0	35
30,000 to 100,000.....	47	0	5	2	1	55
Total cities.....	74	5	7	15	2	103

Table I, from Hull's study, shows the number of cities of various populations that use each of the five aforementioned plans.[1]

[1]Hull, O. R. "The Administration of School Building Programs," American School Board Journal, 73:173, July, 1926.

SELECTION OF SCHOOL ARCHITECT

Everywhere the competition for school architectural business is keen. Let a board of education announce, or even hint, that it is considering the erection of a new building and it will have a host of applicants for the work. Which of these competitors shall be selected becomes then a perplexing question, for architects, like other competitors, are frequently an insistent and persistent group. Each architect thinks, or at least he argues, that he has the best qualifications for the work; some argue further that they are more *entitled* to the work than anyone else. Generally, the unfortunate thing about the whole procedure is that members of a board of education, whose job it is to contract for architectural service, are at a disadvantage in architectural information. They are frequently uninformed on what constitutes good architectural service and are unable accurately to judge the comparative qualifications of the many competitors. Therefore, the architect who talks the loudest and longest, irrespective of his qualifications, often secures the contract. The following practices are in vogue in the selecting of school architects, particularly where project architects are employed.

Architectural competition.—Some boards of education organize competitions to secure their architectural service. That is, they announce that preliminary drawings and sketches may be submitted according to the conditions of the contest which have been arranged. If the competitive plan of hiring the architect is used, the conditions of the competition should be well provided for. The American Institute of Architects has published a circular which gives the organization of an architectural competition and the bases upon which members of the American Institute of Architects should engage in such competitions. School officials who contemplate using

the competitive plan can do no better than to procure this circular and to follow it in the main.[1]

No competitions.—Some boards of education decide upon an architect and employ him without further ado. For example, if an architect has built up an enviable reputation and the board of education has confidence in him and his work, he is given the contract. In a sense, competition does enter into this plan, because the reputation and ability of the various architects are in competition with the qualifications of other architects. Of course, a competition is not announced or organized on a formal basis as is done under the first plan given.

Local versus outside architects.—We have already affirmed that the designing of a school building is a function which requires specialized knowledge on the part of the architect. An architect may be an expert in designing churches, but only a tyro in the planning of school buildings; he may be a specialist in the designing of theaters, but know little about school buildings; he may have acquired an enviable reputation in the planning of hotels, banks, apartment houses, office buildings, bridges, or factories, but know little or nothing of school buildings. To infer that because an architect is able to design some other building he is therefore competent to plan a school building, is as fallacious as to assume that an eye and ear specialist is the best consultant on a disease of the heart. Ours is an age of specialization and the profession of school architecture is no exception to the rule.

These facts, however, are not always understood when the function of selecting the school architect is imminent. Too many school authorities conclude that an architect should be able to plan an up-to-date school building, since he has been successful in designing other buildings. Such argument is applied too often to the *local* architect. For the local architect, it is argued further that he is a taxpayer, that he has children in the local schools. Under the stress of such arguments too many school authorities forget that it is better to secure the *right* architect, although he be an outsider. They forget, if they ever knew it, that school architecture is a profession; they forget that it is only good business to secure the best man for this or any other work, irrespective of his residence. To employ any other than the best qualified in public business is a form of malfeasance: it is a betrayal of public trust. A "protective tariff" should no more be levied on architectural brains than upon teaching brains. When qualifications are equal, school officials are doubtless justified in giving the school work to the local resident, but they are never justified in favoring local talent to the harm of, or at the expense of, the public. A school board that is circumspect will ignore the clamor for the hiring of "home talent," if such talent has nothing more than a residence qualification to commend it.

Cost of School Architectural Service

Competency and other things being equal, it should be the aim of the school authorities to secure architectural service as cheaply as possible. When we investigate what various communities are paying for their school architectural service we find that the charges vary widely. William George Bruce, in an inquiry relative to cities of one hundred thousand and more, found that the cost of school architectural service averages between 5 and 6 percent of the total construction cost.[2] These percents include the cost of providing plans and specifications,

[1] The American Institute of Architects. *Architectural Competitions, A Circular of Advice and Information.* The Octagon House, Washington, D. C.

[2] "Securing School Architectural Service," *American School Board Journal*, 68:87, January, 1924.

engineering service, and supervision of construction.

The usual practice is to figure the supervision of construction at about half the rate of designing the plans and specifications. The American Institute of Architects recommends that 6 percent be the basic charge for architectural services. The Institute specifically says, though, that this charge is not mandatory. On the other hand, it makes it clear that *the size of the fee should be determined by the services rendered.* If the services rendered justify a percentage charge of less than six, well and good; if the services demand a larger charge also well and good.

The data which Bruce reports in his study make it clear that the cities which hire their architects on a salary basis are securing architectural service at a cheaper rate than the cities which secure their architects on a percentage or a cost-plus-fee basis. For example, Akron, Ohio, estimates her architectural cost at 3 percent; Cambridge, Massachusetts, at 5 percent; Cincinnati, Ohio, at 3 percent; Cleveland, Ohio, at 3 percent; East St. Louis, Illinois, at 3 percent; Erie, Pennsylvania, at 2 percent; New Orleans, at 2.25 percent; and Philadelphia, at 1.3 percent. Whether these cities have figured a charge for office rent and upkeep in determining these percents we do not know; obviously, though, such charges should be included.

Among the larger cities it appears that those which hire their architects on a salary basis are securing their architectural service at a lower rate than those which hire them on a percentage or a cost-plus-fee basis. It is possible, however, that this saving is a fictitious one, in that the service given by the salaried architects is not so competent as that given by the project or private architect. Unfortunately, there is no evidence on the public-versus-the-private-architect question which permits us to say which services are better. We must conclude, however, that it all depends on the qualifications of the architect. Who is to say that St. Louis, for example, does not have an unusually splendid group of school buildings—buildings that have been designed by architects working on a salary basis? On the other hand, we could mention communities in which salaried architects have been responsible for poorly designed buildings, buildings which are notorious for their vulgar sameness and general meanness.

OTHER POSSIBLE ECONOMIES IN SCHOOL ARCHITECTURAL SERVICES

Unit plans.—Certain cities, such as Cleveland, Ohio, Gary, Indiana, and Pittsburgh, are using unit plans in constructing school buildings. They have standardized many of the various rooms, that is, they are building their classroom, particularly those used by a certain grade and for a certain type of work, of the same size. This obviously should make architectural work much easier and therefore cheaper. Moreover, the use of these standard plans makes for a considerable saving in the purchase of materials and in general building costs.

State school-building departments.—Some states claim to be saving much money by having a school-building division connected with the state department of public instruction. This division has the function, among other things, of consulting and advising local boards of education on their building problems. It is common for these departments to design standard plans which may be borrowed, adapted, and used for local buildings. The most of these plans, however, are designed for the smaller buildings, usually the one-room buildings; infrequently are they designed for buildings of more than four rooms. Such a department, if efficient, could save, it would seem, thousands of dollars in the typical state. With the typical state spending millions of dollars annually for school buildings, it is evident that

much could be saved by a better regard for the principles of schoolhouse designing and construction.

Supervision and Inspection of Construction

After the plans for the building have been worked out and after the contract for the construction of the building has been let, supervision and inspection of the construction must be provided for to see that it is erected according to specifications. It will be necessary to be sure that the materials used are those which the specifications stipulate and that the construction follows the specifications in detail, unless the consent of the architect and owner to use substitutes is secured.

Three practices of supervising and inspecting the construction of school buildings exist. Generally, the architect looks after this function. In this practice either the architect or one of his agents is on the job almost constantly to see that the work is done according to specifications. In the second case, the owner is responsible for this work. This practice, however, is not as common as the first mentioned. The owner and the architect, under the third practice, both have some responsibility in supervising and in inspecting the construction. This practice should become more common, for both the architect and the owner have an interest in whether or not the work is being done according to plans and specifications. The architect has an interest largely because he is concerned over his professional standing and reputation—the completed building will stand as a silent testimonial, good or bad, to his work. The owner has an interest largely because he is the one who is paying the bill; he cannot risk being "cheated."

The Architect's Contract

A good form of contract between the owner and the architect, particularly in cases where the architect is to work on a job basis and not on an annual salary or a part-time basis, should be provided. Such a contract is necessary both to the architect and his employers; the more definite the contract, the better it is for all concerned. The standard form of contract between the owner and the architect is that designed by the American Institute of Architects. It is recommended that this form should be followed, at least in the main, for it has the particular merit of being specific. It may be modified, of course, to meet the needs of the local situation. Some of the main items which illustrate its nature are: the architect's service; the architect's fee; reimbursements; separate contracts; extra services in special cases; payments; the owner's decision; survey, borings, and tests; supervision of the work; ownership of documents; successors and assignment; and arbitration.

The American Institute of Architects.—Those who are responsible for constructing school buildings can find nothing of greater consequence on the best methods of securing architectural services than in the literature of the American Institute of Architects. It is perhaps not amiss to say that this is the national organization of architects, a body which is analagous to such organizations as the National Education Association, the American Bar Association, and the American Medical Association.

The more pertinent publications of the American Institute of Architects are listed here for reference. With the exception of the first four, the documents are either free or may be had at a very low price. In familiarizing oneself with architectural business, one can make no better investment than to spend a few cents for the more pertinent of the publications.[1] These are: *Journal of the American Institute of Architects;*

[1]Communications and remittances should be sent to the Executive Secretary, American Institute of Architects, The Octagon House, Washington, D. C.

Handbook of Architectural Practice; Standard Contract Documents: "Agreement and General Conditions," "General Conditions without Agreement," "Agreement without General Conditions," "Bond of Suretyship," "Form of Subcontract," "Letter of Acceptance of Subcontractor's Proposal;" "The Standard Form of Agreement between Owner and Architect (Percentage Basis)"; "A Form of Agreement between Owner and Architect (Fee-Plus-Cost System)"; "A Circular of Information on the Fee-Plus-Cost System of Charges (Explanatory of Owner-Architect Agreement on Fee-Plus-Cost Basis"); "A Form of Agreement between Owner and Contractor (Cost-Plus-Fee Basis)"; "Circular of Information Relative to Cost-Plus-Fee System of Contracting (Explanatory of the Contractor-Owner Agreement on Cost-Plus-Fee Basis)"; "A Circular of Advice and Information Relative to the Conduct of Architectural Competitions"; Standard Form of Competition Program; "Circular on the Functions of the Architect"; "A Circular of Advice Relative to Principles of Professional Practice, The Canons of Ethics"; "Schedule of Proper Minimum Charges"; "Standard Symbols for Wiring Plans."

TEACHING ADDITION AND SUBTRACTION FACTS TOGETHER OR SEPARATELY

B. R. BUCKINGHAM
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LAST year, the writer was faced with the necessity of making a number of decisions regarding the teaching of arithmetic, and he sought to find answers to a variety of questions. One of these was the question, "Is it better to teach subtraction facts in connection with related addition facts or to teach the addition facts first and the subtraction facts afterwards?"

When this question was asked of classroom teachers and primary supervisors, no "preponderance of testimony" was secured. One supervisor whose competence was above question said, "I have tried both methods and I am sure that the separate method is better." Another whose success was quite as evident was equally sure that the together method produced better results. Neither supervisor, however, had ever obtained the least evidence in support of her view. Each was quite positive she was right and each was able to offer good reasons drawn from general principles. Classroom teachers likewise lent the support of practice and of argument to both sides of the question.

This sort of appeal to authority therefore did no more than darken counsel with words. Under these circumstances an attempt was made to arrange for the teaching of both methods to groups of equally capable children and to test results. This work was undertaken at seven different centers in various parts of the country. The procedure at one of these centers will be described in some detail and the general results secured by similar procedures at the other centers will then be presented.

Center No. 1.—Attention is now directed to a class of thirty-seven children who, in February, 1926, were beginning the low-second grade. These children were about to learn the fundamental addition and subtraction facts. On February 8 they were given a Pressey

Primary Classification Test, and, according to the scores made on this test, they were divided into two groups, which were equal in the ability measured by the test. The two groups were made equal by the simple device of pairing each pupil in one group with a pupil in the other of the same or nearly the same score.

The teacher then taught a specified list of addition and subtraction facts to both groups of children. To one group, however, she taught the addition facts and the related subtraction facts together while to the other group she taught all the addition facts and afterwards all the subtraction facts. The first of these groups will be called the Together Group, the second, the Separate Group.

The list of facts, thirty-eight in number were as follows:

Addition Facts	Subtraction Facts
1 + 6, 6 + 1	7 − 1, 7 − 6
4 + 5, 5 + 4	9 − 4, 9 − 5
1 + 2, 2 + 1	3 − 1, 3 − 2
4 + 4	8 − 4
1 + 3, 3 + 1	4 − 1, 4 − 3
2 + 5, 5 + 2	7 − 2, 7 − 5
1 + 8, 8 + 1	9 − 1, 9 − 8
2 + 3, 3 + 2	5 − 2, 5 − 3
1 + 5, 5 + 1	6 − 1, 6 − 5
2 + 4, 4 + 2	6 − 2, 6 − 4

The teacher was directed to present to the Together Group all the facts of each line before presenting those of the next line. The order of presentation *within the line* was not regarded as important. The Separate Group was to be taught all the addition facts followed by all the subtraction facts. In teaching the addition facts to the Separate Group the direct and reverse facts, for example, 1+6=7 and 6+1=7, were to be taught together. Similarly, the Separate Group was to receive the direct and reverse subtraction facts together. In the case of doubles, such as 4+4 and 8−4, there is, of course, no distinction between direct and reverse facts.

No directions were given to the teacher as to the way in which the number facts should be developed. The teacher might introduce them by the use of objects or merely as verbal facts to be learned. The rôle of visual presentation was likewise undetermined. One point, however, was insisted upon, namely, that the technique of presentation, whatever it might be, should be the same for both the Together and the Separate Groups.

It was suggested that the teacher devote twenty minutes daily to the teaching of each of these groups. It was pointed out, however, that the length of time was relatively unimportant provided the same amount of time was given to each group of children. The teacher was directed to alternate the periods of recitation. For example, the Together Group might recite the first week from 10:10 to 10:30 and the Separate Group from 11:00 to 11:20. If such an arrangement was made for the first week, the arrangement for the second week should call for the Together Group to recite from 11:00 to 11:20 and for the Separate Group to recite from 10:10 to 10:30. The third week the periods of recitation should be the same as for the first week, the fourth week the same as the second, and so on throughout the experiment.

It was stipulated that all drill and review work in arithmetic should be done at school, in other words, that no home work and no outside study should be required. During the progress of the experiment no other subject-matter in arithmetic was to be taught except the addition and subtraction facts called for by the experiment. It was recognized that local conditions and courses of study might necessitate some variation from this rule. If such were the case the teacher was to see that the additional subject-matter was the same for the two groups.

(*Continued on page 240*)

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STATISTICAL THINKING ONCE MORE

WE have already taken occasion to air our opinions in these columns on the question of thinking statistically. We have indicated that in our judgment statistics offers a new and powerful instrument of thought. It is our present purpose, however, to indicate one of the dangers incident to the use of statistics in the analysis of phenomena.

The very attractiveness of statistical technique sometimes leads to our undoing. Under the influence of statistical method our thinking tends to lose flexibility, to harden, and to crystallize into set forms. When we decide to use measurement, and the analysis which measurement permits, we put our trust in precision, accuracy, and definition. This is desirable up to a certain point; but there are wide reaches of human thought where precision is not at present possible or where it can only be attained by non-statistical methods. To let our statistics dominate our thinking in these regions is to court disaster.

Consider, for example, the attitude which is frequently assumed toward the correlation coefficient. A certain statistical textbook states that when r is less than .15 or .20 it may be regarded as "negligible or indifferent"; that when it ranges from .15 or .20 up to .35 or .40 it may be thought of as "present but low"; and that it may be called "marked" and "high" according to whether it hovers around .50 or runs above .60. All this shows the tendency of human beings to avoid thinking by reducing data to types which are assumed to have general application.

It is certain that under appropriate circumstances a correlation coefficient of .20 is by no means "negligible or indifferent." An illustration may serve to establish this point of view. In the Bureau of Educational Research at Ohio State University a study was undertaken a year or two ago in which, among other things, an attempt was made to show the effect of different types of state departments of education upon the efficiency of the public schools. Now, among the forty-eight states, there is great variation in the types of educational departments. Some have state boards of education and others do not. Those which have such boards provide for the selection of the members in a variety of ways. The chief executive in some states is elected by the people, in others he is appointed by the governor, and in still others he is chosen by the state board of education. Certain types of administrative organization have existed in the past and have been abandoned. No one knows of a certainty which is the best. It occurred to us therefore that if we could evaluate these types, we might then compare them with school efficiency.

Variable No. 1, then, was school efficiency. It included such items as length of school term, percent of school population enrolled in the public schools, percent of pupils in average daily attendance, amount of money spent per pupil, and amount spent per unit of wealth. Variable No. 2 was the composite rating, by about one hundred judges, of the desirability of the types of organization which had already been distinguished.

It was found that the correlation coefficient between the measures of state

departments and the measures of school efficiency was +.20. According to the classification of *r*-values, to which reference has already been made, a negligible relationship is thus indicated. This, we believe, is very far from the truth. The field of variation, particularly with reference to the first variable—the efficiency of the schools—is enormously complex. The play of forces within it is checked, balanced, and conditioned in a multitude of ways. By a thousand channels of influence, most of them local in character, is the excellence of the schools effected. To select one of these influences, an influence which by its very nature is remote from the scene of action, and then to find a correlation coefficient of +.20 is in reality to hit upon a very significant matter.

The interpretation of the correlation coefficient cannot proceed upon its size alone. Even strictly statistical considerations should prevent this. A correlation coefficient of .90 may indicate as close a relationship as a correlation coefficient of .40 if the "spread of talent" in the first case is eight or ten times as great as in the second case. Purely statistical precautions tell us that we must know the path over which the computation of a correlation coefficient has proceeded.

In the illustration we have just described, however, the interpretation of the resulting coefficient must proceed on a non-statistical basis. It must take into account the conditions to which the relationship applies. In particular it must take account of the *purpose* which the relationship is to serve. If a reading test achievement correlates with a valid criterion of reading ability to the extent of no more than +.20 it indicates a negligible or indifferent relationship from the point of view of the validity of the test. If an instrument for predicting success in teaching correlates to the same degree with success on the job, we do not regard the measurements in question as having useful predictive value. But, if the correlation of rainfall with crops of a certain kind were found to be +.20, or if a vegetable diet were found to be related to that extent with length of life, we should not hesitate to attribute a high degree of significance to the relationship nor should we long refrain from taking steps to secure the advantage which the relationship suggested. Similarly, if the presumed desirableness of a state organization has even a small numerical relationship to such fundamental facts, or to a pooling of such fundamental facts, as the amount of schooling, the number of young people who avail themselves of it, and the expenditure that people are willing to make for it, then nothing can justify indifference to the organization which the state provides.

On the other hand, it is evident that there are circumstances under which a correlation coefficient of .60 or .70 may not be regarded as high. A correlation coefficient of .60 yields a coefficient of alienation of .80. This means that a determination of one variable from the other would be but 20 percent better than a pure guess. Suppose that one variable is a score in an intelligence test and another is success as a student in college. Before we would take drastic action such as denial of admission to college we should certainly want to be in possession of an instrument which would yield a wider margin than 20 percent beyond what we would get if we merely drew the names of the students from a hat.

The mechanical interpretation of the correlation coefficient is only one of a number of instances—the similar interpretation of the probable error of differences is another—in which users of statistics try to make their statistics cover too much territory. We shall never be relieved by statistics or by any other device from the necessity of original thinking.

AN EDUCATIONAL OBJECTIVE

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FROM a liberal sampling of senior high-school principals throughout the country, the writer recently procured judgments regarding the relative emphasis that should be given to each of the seven main objectives of secondary education as defined by the Commission on the Reorganization of Secondary Education. A summary of the rankings of the objectives was given in an article by the writer in the preceding Bulletin.[1] The intent of this paper is to give particular attention to a consideration of one of these objectives—"worthy use of leisure," to comment on the findings, and to make some inquiry as to how leisure time is now employed.

In addition to being asked to weight the seven objectives as they believed their relative importance to be, these senior high-school principals were also requested to answer the following question: "Do you agree with the statement that education for the worthy use of leisure is of increasing importance?" Three hundred and eighty-one principals participated in the study, and 254 attempted to reply to the part dealing with the "seven main objectives." Of these 254, there were 224 who attempted to weight the objectives on a scale of 100 points as requested, while thirty others simply ranked them. The 224 principals, when their weightings were averaged, assigned 13.0 points to "worthy use of leisure" which gave it fifth rank among the seven. The other thirty principals ranked it seventh.

The data presented here and in the former article cast some light on the educational philosophy of an important group of school administrators concerning the function of the school. Coming, as it does, from a representative sampling of principals scattered throughout the nation, who have direct charge of high schools varying in enrollment from forty-two pupils to seventy-seven hundred, such a composite judgment should receive serious consideration.

C. L. Phelps, president of State Teachers College at Santa Barbara, California, reports a similar study.[2] He presents a table showing the average judgments of sixty-two city superintendents and teachers' college presidents when they weighted the first six objectives on a scale of 100 points. Only six were used in this evaluation because he feels that "ethical character is an inclusive objective and cannot be weighted in terms of the others." It is interesting to note that this group gave an average of 10.4 points to worthy use of leisure, or an average of 2.6 points less than that assigned to this objective by the high-school principals. Since the rating reported by President Phelps does not include the seventh objective, ethical character, the three weightings are not entirely comparable, but they do seem to indicate that, in the judgment of these groups, from 10 to 13 percent of the school's time and energy should be given to training pupils in the worthy use of leisure. When we add to this the fact that more than 95 percent of the principals said that this type of training is of *increasing* importance, we may be justified in concluding that even more than 13 percent of the school time should be allotted to this objective a few years hence.

[1] "What Objectives, If Any, Shall We Stress?," 6:210–12, May 11, 1927.

[2] *The Elementary School Curriculum*. Second Yearbook, Washington, D. C., Department of Superintendence, 1926. p. 85.

The late Dr. Charles P. Steinmetz said that "Four days of four hours each are sufficient to do all the work the world needs to live on." If the sixteen-hour week should come to pass within the next hundred years, as Dr. Steinmetz suggests, the social and educational problems that would follow would be scarcely less significant than the economic. Avocational and recreational training would become almost of more importance than vocational. Perhaps they are of more importance even now than we are willing to admit because of our traditional habits of thought. Something would have to be provided so that people might profitably employ the large amount of time that would not be used in vocational pursuits. Mr. Hammond, Dr. Steinmetz's biographer, states further:

> Steinmetz never had in mind a day made up of four hours of productive work and twelve hours of lazy idleness. He pictured something far more stimulating than that. He looked forward to an era of such quickened mental development, such advanced and universal education, that people would spend much of their twelve hours of leisure in cultivating their higher natures, in acquiring uplifting knowledge, in seeking soul-awakening recreation as well as upbuilding of physical health.[1]

Whether we shall ever attain the sixteen-hour week, or not, we are on our way towards it. Within the last quarter of a century we have seen the standard working week reduced from sixty hours, or even eighty-four hours in the steel industry, to forty-eight hours and, in some instances, to forty-four hours. Now comes the declaration of the head of the American Federation of Labor in favor of a five-day week of forty hours for workers and the announcement of its adoption by such an important employing agency as the Ford interests. These events in the industrial world should arrest the attention of educators and social workers as well as of economists and employers. Training for the worthy use of leisure is becoming more and more necessary, and is of increasing importance.

The educational implications of the present highly industralized age, "dominated by automatic machinery," are forcibly portrayed by that keenly discerning editor, Arthur Pound. Describing the situation in a prominent automobile manufacturing city of Michigan, he says in part:

> In a town dominated by automatic machinery, therefore, the educational problem is to train youth for the right use of leisure. Why waste time teaching city children how to work, when the chief need is to know how to live? . . . . Education for leisure, under the conditions of automatic production, is education for life.[2]

For fear that Mr. Pound's question might be misinterpreted, it should be said that in the context he maintains that, since workers will be using automatic machinery, the operation of which can be learned on the job in a very brief time, and since the way the machine works in producing the desired result need not be known to the worker, it is a waste of time to give them long periods of school training in how to work. Rather, teach them "how to live."

The prediction of Steinmetz, the action of the Ford interests, the pronouncement of the American Federation of Labor—although it is not yet realized, and the observations of Pound, all tend to support the thesis that training for the worthy use of leisure is becoming of increasing importance. Many of our present pupils are part-time workers and most of the others will soon be full-time employees. What will they do with their extra day, with their two-day week-end? Will it be spent in recreation that is profitable as well as pleasurable? In short, what kinds of recreation will they seek? Indeed, we need not wait until they become

[1] Hammond, J. W. *Charles Proteus Steinmetz: A Biography.* New York, The Century Company, 1924. p. 377ff.

[2] Pound, Arthur. *The Iron Man in Industry.* Boston, Little, Brown, and Company, 1922. Chap. 10. This chapter is reprinted in *The Path of Learning: Essays on Education,* Holmes, Henry W., and Fowler, Burton P. (editors). Boston, Little, Brown, and Company, 1926. pp. 71–87.

employees. Since their parents and older brothers and sisters will have an extra day off, what they do during their leisure time will, in many cases at least, influence what the younger members of the family will do. Can we train these older members in a wholesome use of their leisure time by giving more attention to this factor in the training of the in-school members?

Before we can be of any real assistance in any project that is already started, we must first know what has been done and with what results. It is therefore relevant to our subject to investigate the nature and development of some of our leisure occupations. Within the lifetime of most of our readers, the unprecedented development of such immense industries as the motion picture, radio, and automobile has taken place. The capital invested in them and the income realized from them are conclusive proof of their patronage. Again, we are reminded that such things as auditoriums, libraries, music halls, art galleries, museums, parks, stadiums, watering places, speedways, boardwalks, and Boyle's Thirty Acres have been created, partially, at least, for the employment of leisure. On first thought it may therefore appear that sufficient attention has already been given to leisure. But, we recall that the Commission names not leisure but the "worthy use of leisure" as one of the seven great objectives of education. One of the functions of education is to substitute *worthy* use of leisure for just *any* use of leisure that seems to be most convenient at the time. This involves a development of wholesome appreciations in the individual that will, in turn, demand higher types of reading-matter, music, pictures, sports, and other forms of recreation.[1]

Because of lack of space, only one of the many leisure occupations, that of reading—and it is only *partially* a leisure occupation—can be considered here. Two types of reading are generally recognized today, the informational or work type and the recreatory or leisure type. Since we are concerned here with leisure, we shall limit our attention in this paper to the recreatory type. To attempt to add to what Bobbitt has so well written on this subject from the theoretical standpoint in his famous chapter, "Reading as a Leisure Occupation," would be futile.[2] Rather, let us look at the problem objectively by examining the results of several investigations regarding the character of magazine reading done by various groups of people. Some of the findings of these studies are shown in the following tables and comments.

Table I is made up of data taken from two studies made by Rasche[3] and Osburn.[4] The first two columns of the table, which show the ten magazines most frequently read by 3,539 young workers (boys and girls) in Milwaukee, present a rather striking contrast to the magazines named in Column three, which are the ones Osburn found to be most often read by 1,759 children in Grades I to XII of four Wisconsin villages and one city. At once, the question arises, "Why this difference?" Does the fact that the 1,759 children are still in school as *full-time* pupils, while the other 3,539 are only *part-time* pupils help to explain the difference? To what extent does the school direct and control the reading done by the pupils? To what extent will the school influence carry over into after life? What effect might the associations of the part-time pupils have? Is age a probable factor?

Furthermore, the Rasche report states that "the newspaper has a greater grip

[1] A book which is of interest in this connection is President George Barton Cutten's *The Threat of Leisure*. New Haven, Connecticut, Yale University Press, 1926. x + 166 pp.

[2] Bobbitt, Franklin. *The Curriculum*. Boston, Houghton Mifflin Company, 1918. pp. 227–43.

[3] Rasche, William F. *The Reading Interests of Young Workers*. Milwaukee, Milwaukee Vocational School, 1925. Mimeographed. p. 41.

[4] Osburn, W. J. *A Study of Children's Interests*. Madison, Wisconsin, State Department of Public Instruction, 1926. Mimeographed. pp. 4–6.

on the young workers than have either magazines or books," that the newspaper interest is apparent even before they become workers and that it grows as they become older. The boys indicate a loss of interest in both books and magazines as they grow older, while the girls show an increasing interest in magazines and maintain their former interest in books. Another part of the report shows that of the 9,130 different books read by 7,065 boys and girls during a period of six months, "2,817, in Table I are interesting. We find that *True Story* is given first place by the pupils studied in three cities, and that it is mentioned among the first ten magazines by six of the seven groups. This periodical now prints on its front cover the statement, "The largest news-stand sale in the world." That its readers are not confined to youth, chronologically speaking, is common knowledge.

Comparing the findings of the three investigations which have been summarized in Tables I and II, we find that

TABLE I

TEN MAGAZINES MOST READ BY 3,539 YOUNG WORKERS IN MILWAUKEE AND BY 1,759 CHILDREN IN GRADES I TO XII OF FOUR WISCONSIN VILLAGES AND ONE CITY*

WORKERS IN MILWAUKEE FROM 14 TO 18 YEARS OF AGE		PUPILS IN FOUR WISCONSIN VILLAGES AND ONE CITY
Boys (2,252)	Girls (1,287)	
(1)	(2)	(3)
True Story	*True Story*	*American*
Popular Mechanics	*Collier's*	*Literary Digest*
American	*American*	*Saturday Evening Post*
Saturday Evening Post	*Woman's Home Companion*	*Popular Science Monthly*
Collier's	*Ladies' Home Journal*	*Ladies' Home Journal*
Radio News	*True Romance*	*True Story*
Western Story	*Photoplay*	*McCall's*
Literary Digest	*Love Story Magazine*	*American Boy*
Popular Science Monthly	*Red Book*	*National Geographic*
Red Book	*Pictorial Review*	*Boy's Life*

* All magazines are named in the order of frequency of mention.

or nearly one-third of them, were not circulated by the public library because they were deemed unsuitable reading."

Let us examine the findings of another investigation. Huber and Chappelear have reported a study made to determine the magazine preferences of a large number of children in Grades III to IX, in five schools in four cities of New York and New Jersey.[1] Comparisons between their data as given in Table II and the findings of Rasche and Osburn as given *Literary Digest* and *Popular Mechanics* are named four times; *American*, *Ladies' Home Journal*, *Popular Science*, *Liberty*, and *Western Story*, three times; and *Love Story* and *Detective Story*, two times. The reader can make other observations. It should be kept in mind in examining Table II that, in the three schools in Jersey City and Manhattan, children in Grades III to VIII were indicating their preference.

Terman, in reporting the reading done by one thousand gifted children, believes that "general intelligence influences not only the amount of reading

[1] Huber, M. B., and Chappelear, C. S. "Children's Magazine Reading," *The Journal of Educational Method*, 6:145–49, December, 1926.

but also its quality and range."[1] Gray, in a comment on Terman's statement, says that "Investigations are needed to determine the extent to which the kind of reading done by these gifted children affects intelligence."[2] Might it not be valuable to know, in addition, the extent to which the kind of reading done by children—and adults—affects their behavior, particularly their ethical behavior?

Since we have been considering the periodical reading done by several groups of persons of school age, let us now turn our attention to the same type of reading done by adults. It is unfortunate that there seem to be no studies of the amount and kind of reading done by the general *adult* public. Circulation figures given out by certain publications give us a suggestion as to the extent of magazine reading, but we do not know what part of this can be credited to adults and what part to youth. Reeder's studies[3] show that, in 1922, the three Pacific states ranked highest, followed by the New England states, in the percent of their population reading ten of the most popular magazines. These states also ranked highest in the circulation of certain "high brow" magazines. Reeder also found that "the ranks of all the states on the two groups of magazines are very similar, the coefficient of correlation being 0.93."

Since no statistics on the amount and kind of reading done by adults throughout the country are available, we shall have to confine ourselves to certain studies of adult reading in selected groups and districts. Parsons finds that city people read far more than country people; that professional persons read far more than persons of other occupations; and that the more extensive the schooling, the larger the amount of reading done.[4] This is as one would expect. Morrison reports the non-professional magazines most frequently read by 454 school principals in Ohio.[5] His list has been incorporated in Table III, along with a similar list showing

TABLE II

MAGAZINE PREFERENCES OF CHILDREN IN CERTAIN SCHOOLS

Two Schools in Jersey City, (659 Pupils, Grades III–VIII)	Public School 43, Manhattan, New York, (Grades IV–VIII)	Trenton, New Jersey, (Junior High School)	Mamaroneck, New York, (433 Pupils, Grades VI–VIII)
(1)	(2)	(3)	(4)
True Story	*True Story*	*Saturday Evening Post*	*Saint Nicholas*
Saturday Evening Post	*Popular Science*	*National Geographic*	*Boys' Life*
Boys' Life	*Boys' Life*	*American Boy*	*American Boy*
Liberty	*Popular Mechanics*	*Ladies' Home Journal*	*Good Housekeeping*
Popular Mechanics	*Detective Stories*	*American*	*National Geographic*
Detective Stories	*Saturday Evening Post*	*Liberty*	*Youth's Companion*
Ladies' Home Journal	*Western Stories*	*Collier's*	*Saturday Evening Post*
Western Stories	*American Boy*	*Literary Digest*	*Popular Mechanics*
National Geographic	*Liberty*	*Popular Science*	*True Story*
Literary Digest	*Saint Nicholas*	*Delineator*	*Red Cross*
Love Story	*Boy Scout*	*Boys' Life*	*Photoplay*

[1]Terman, Lewis M., et al. *Genetic Studies of Genius.* Stanford University, California, Stanford University, 1925. I, p. 447.

[2]Gray, William S. "Summary of Reading Investigations (July 1, 1924, to June 30, 1925)," II, *The Elementary School Journal*, 26:309, March, 1926.

[3]Reeder, Ward G. "Which States Read the Most?" *School and Society*, 18:235–40, August 25, 1923, and "Amount and Kind of Reading in the Various States," *Educational Research Bulletin*, 3:179–82, April 30, 1924.

[4]Parsons, Rhey Boyd. "Study of Adult Reading." An unpublished Master's thesis, Department of Education, University of Chicago, 1923.

[5]Morrison, J. Cayce. *The School Principalship in Ohio Cities and Exempted Villages.* Columbus, Ohio, The Ohio State University, 1925. pp. 33–34.

the magazine reading done by 500 Ohio State University Alumni.[1] The data given in this table bring out some interesting facts when the reading of the five groups of adults is compared. Such a comparison seems to substantiate the findings of Parsons. It is also interesting to note that the three magazines most read by the 1,759 pupils in four villages and one Wisconsin City—Column 3, Table I—are the same as those read most frequently by the 500 Ohio State University Alumni, and that these magazines are also named in the same order. Does not the reading-matter mentioned by these 1,759 children seem rather "grown-up?"

Numerous other references relative to the type of reading done could be summarized if space permitted. Opportunity will be taken, however, to make brief reference to some that should not be overlooked. As to the distribution of a certain type of reading-matter and the extent to which it is read, the reader can find some valuable information in an article by George Millard Davison.[2] Mr. Davison, principal of one of the New York elementary schools, made a personal investigation of the kind of reading-matter sent out by wholesale news agencies in his city and the facts he presents are startling. The article by Oswald Garrison Villard, published in the *Atlantic Monthly*, for March, 1926, will also be found to be illuminating. Finally, we might suggest the debate between Mr. Villard and Martin Weyrauch on the subject, "Are Tabloid Newspapers a Menace?," which appeared in *Forum*, for April, 1927.

TABLE III

THE TEN NON-PROFESSIONAL MAGAZINES MOST READ BY 454 SCHOOL PRINCIPALS IN OHIO AND BY 500 OHIO STATE UNIVERSITY ALUMNI

OHIO SCHOOL PRINCIPALS (454)			OHIO STATE UNIVERSITY ALUMNI
Elementary (379)	Junior High (25)	Senior High (50)	
(1)	(2)	(3)	(4)
American	*American*	*Literary Digest*	*American*
National Geographic	*National Geographic*	*American*	*Literary Digest*
Literary Digest	*Literary Digest*	*National Geographic*	*Saturday Evening Post*
Saturday Evening Post	*Outlook*	*Saturday Evening Post*	*National Geographic*
Atlantic Monthly	*Saturday Evening Post*	*Outlook*	*Atlantic Monthly*
Ladies' Home Journal	*Ladies' Home Journal*	*Review of Reviews*	*Cosmopolitan*
Pathfinder	*Pathfinder*	*Atlantic Monthly*	*Good Housekeeping*
Good Housekeeping	*Atlantic Monthly*	*World's Work*	*World's Work*
Woman's Home Companion		*Current History*	*Outlook*
World's Work		*Century*	*Collier's*

Regardless of whether the conditions reported by Rasche, Davison, Villard, and others are general, their disclosures present a problem which challenges the great institutions of organized society. The school is one of these institutions. Upon it are placed responsibilities which cannot be treated apathetically. Idleness and misused leisure time do not contribute to social efficiency.

[1] *Ohio State University Monthly*, 16, No. 7, p. 23. April, 1925.

[2] Davison, George M. "What Do Boys Read?" *The Status and Professional Activities of the Elementary School Principal.* The Third Yearbook. Washington, D. C., Department of Elementary School Principals of the National Education Association, 1924. pp. 322-23. (Bulletin of the Department of Elementary School Principals, Vol. III, No. 4, July, 1924)

ON THE FIRING LINE

R. G. Guthrie, who has been a familiar figure around the Department of Principles of Education at Ohio State University, will be found at Marietta College as Assistant Professor of Education after September 1, 1927.

Zura Walters, of Grandview Heights, has joined the "rotary club" along with Mr. Roudebush and Mr. Rohleder. Mr. Walters goes to Hillsboro as Superintendent to succeed Mr. Rohleder who came to Grandview Heights as successor to Mr. Roudebush.

Superintendent Charles A. Ford, of Fletcher, Ohio, has accepted a position with the State Bureau of Juvenile Research. The Fletcher schools in the past years have had a hard struggle for existence. Mr. Ford's contribution for the last two years has placed these schools on a sound academic and financial basis.

Ohio Wesleyan University is making extensive preparations for additional teacher-training facilities. To this end they have taken over the schools of Ashley, in Delaware County, and will cooperate with the Board of Education of that village in making the schools the best possible for teacher training. As a matter of course, expert teachers are being employed. These teachers work under the direct guidance of Superintendent R. B. Warner.

Rushsylvania, in Logan County, is undergoing a regeneration in school affairs. After a careful survey of the entire county, enough territory was added to Rushsylvania to make this village a natural school center. With a new building program on, Superintendent D. J. Pyers will be able to organize a high-class village-school system and have it working by September 1.

Springfield, Massachusetts, furnished the successful candidate for the superintendency at Lakewood, Ohio. Two interpretations have been given of the selection of an out-of-state-man. One is that he was an outstanding candidate, which is true. The other suggests a lack of cooperation among Ohio applicants. We believe the first interpretation is correct.

The Trumbull County schools, under the leadership of County Superintendent John C. Berg, are attracting much attention in northeastern Ohio. One full page of school news of Trumbull County is published each week in the Warren newspaper. This activity gives the patrons of the county evidence of the progress of their schools and incidentally stimulates better work among the teachers.

Superintendent Drummond, of Logan County, is conducting a unique program for improving teaching in his county. Last summer William Russell, formerly superintendent of Williams County, was added to the staff, and he has had immediate charge of the program to improve teaching by centering attention upon curriculum study and revision. This has not been attempted by laying a full-fledged program before the teachers of the county for their acceptance or even by developing with them a program upon which all were to work. Rather, it has been a program of stimulation, discovery, encouragement, and assistance. The curriculum problem was placed before the teachers. Wherever an individual or group showed interest in any type of work, the supervisor encouraged and helped each in the study of that topic. The measure of success was taken to be the number of teachers aggressively and intelligently at work upon an educational problem. The

result of the first-years work has been especially characterized by this variation in form of supervisory leadership.

Samuel W. Fogle, director of Child Accounting in the Cincinnati Public Schools, is doing an outstanding work among the children of low mentality in Cincinnati. The laws of Ohio allow boards of education to dismiss children of low mentality under certain conditions. It is easier to let these children go than to take care of them. Mr. Fogle feels that he owes these children every possible attention. To that end he insists upon a full and complete examination of the child together with a complete home survey. If the report indicates that the child is unable to do the regular school work, a follow-up survey is made. By this service the child is placed in some activity which will satisfy his needs. This service is proving beneficial to many children who are dismissed from the public schools.

County Superintendent J. H. Hixson, of Auglaize County, has worked out a system whereby he keeps in touch with every family of the county having children of school age. He uses a system of spot maps, which give a continuous record of the families moving into or out of Auglaize County. Every teacher is required to cooperate in keeping this record up to date. While the detail involved seems to be great, the results obtained are sufficient to warrant his efforts.

EDUCATIONAL READINGS

PHILLIPS, FRANK M. *Public High-School Enrollments by Size and Accreditment*, *ASBJ*, 74:46, 159, April, 1927.

Two interesting tables are presented regarding high-school enrollment in the United States. The first of these shows the enrollment in the various states of the Union for the accredited and the nonaccredited schools by grades; the second gives the number of high schools in each state which fall within certain enrollment limits, starting with "1–50" and extending by increments of fifty to "over 1000." Of the 14,827 high schools classified in the latter table, 5,110 have enrollments of from 1–50; 614 have enrollments of more than 1000; and the average is about 168. The largest high school is one in New York with 8,410 pupils. On the other hand, there are several hundred schools with less than twenty-five pupils each.

REEDER, WARD G. *The Need of a National Code of Ethics for Teachers*, *S&S*, 25:417–21, April 9, 1927.

This is a reprint of an address given by Dr. Reeder at the recent meeting of the American Association for the Advancement of Science, held at Philadelphia. He briefly reviews the history of codes of ethics that have been adopted by various vocations, and he points out that "compared with other professions, teachers have been tardy in adopting such codes." At the present time, however, thirty state teachers' associations have adopted codes of ethics, while the other eighteen state associations are contemplating doing so. While he recognizes that these thirty codes have done, and are doing, a valuable service, he maintains that greater value could be secured from a national code.

WINCH, W. H. *Can Observation Be Trained in School Children?* *JER*, 15:229–38, April, 1927.

The experiment on training in observation is to be reported in a series of articles of which this is the first. Winch finds that perceptive ability can be improved, as well as the ability to remember perceptions and state them verbally. He thinks it doubtful whether sensory acuity was improved as a result of the experiment.

BUCKINGHAM, B. R. *Leadership in Educational Research*, *JER*, 15:239–45, April, 1927.

There is need of quantity production in research. In order to produce the verified and scientifically defensible body of knowledge which is demanded there must be leaders as well as followers. The leader should have practical school experience, must be able to win the support and confidence of teachers, must be able to train workers, must have the ability to analyze his problems, must be a scholar in his chosen field, and must have "extractive power." There are other things that he must be and do, but this shows the general tenor of the article.

NOTE.—The abbreviations used in this number are: *ASBJ*, American School Board Journal; *S&S*, School and Society; *JER*, Journal of Educational Research; *JEM*, Journal of Educational Method; and *AM*, Atlantic Monthly.

HAWKES, FRANKLIN P. *Educational Guidance through Organization and Supervision of a College Week, JEM*, 6:342-52, April, 1927.

James M. Glass is quoted as saying in an address: "The biggest problem of the junior high school is guidance. When the principals of junior high schools have worked out that problem the future of our boys and girls will be placed on a firmer foundation." This article describes an earnest and unusual attempt to partially solve the problem of educational guidance. Mr. Hawkes is principal of the Junior High School West, of Arlington, Massachusetts, and the procedure he followed in his school, as outlined in this article, is worthy of careful reflection by all school administrators, whether junior high-school principals, or not.

PALMER, GEORGE HERBERT. *The Junior College: An Indictment*, AM, 139:497-501, April, 1927.

This distinguished Harvard professor holds that the development of the junior college will mean the deterioration and virtual elimination of the present four-year college and that reliance for education beyond the junior college must necessarily fall on the state. He feels that colleges would become professional schools. This he deplores because, first, America is the only country which has ventured to interpose four years of culture between its day schools and its professional training, and this type of training should not be lost; and, second, those who completed their college course but who did not continue their training in professional schools form what he calls "the scholarly amateurs," "the public-minded class"—persons who have become community leaders because of ideals gained while in college, who are interested in the cultural development of their communities. This class of people, he says "will disappear," and we can ill afford to lose them.

FREDRICK, ROBERT. *An Investigation into Some Social Attitudes of High-School Pupils*, S&S, 25:410-12, April 2, 1927.

This is a study made to determine the social attitudes of 1,166 pupils in seven high schools located in five states. The investigator concludes that "an examination of the results shows a decided lack of intelligent patriotism." For example, "Fifty-nine percent of the students examined believed that, as a nation, we have never mistreated the people of any other race or nation, and fifty-seven percent believed that the American people place a higher value on law and order than do any other people." Furthermore, he found that the amount of reading they had done with respect to international affairs was meager and that they had decided prejudices against several other races. While reading this report, the reviewer was reminded of three other recent writings: "Where Do We Get Our Prejudices?" by Robert L. Duffus, in *Harper's* for September, 1926; *The Menace of Nationalism in Education*, by J. F. Scott; and *Public Opinion and the Teaching of History*, by Bessie L. Pierce.

MELBY, ERNEST O. *A Check List for the Preparation of Rules, Regulations, and Written Instructions, ASBJ*, 74:41-42, 152, April, 1927.

A suggestive check list of the items concerning which it is probable that school systems will need rules, regulations, and written instructions is presented under the four main heads, Boards of Education, Administrative and Executive Staff, Rules and Regulations Controlling Personnel Relations, and General Administrative Regulations. The method of job analysis is recommended for arriving at what should be included in the written instructions concerning the performance of the duties of the various employees of the school system.

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TEACHING ADDITION AND SUBTRACTION FACTS TOGETHER OR SEPARATELY

(*Continued from page 229*)

At the conclusion of the experimental period, which at Center No. 1 lasted about one month, a test was given. This test consisted of the thirty-eight addition and subtraction facts presented as teaching-matter during the course of the experiment. One of the addition facts, however, was repeated and so also was one of the subtraction facts. Thus the total number of exercises in the test was forty. The score for each pupil's paper was taken as the number of examples correct. The maximum obtainable score was therefore 40. Table I shows the results of the preliminary and final tests for Center No. 1. It is to be understood that each line represents a pair of pupils. The reading of the first line is as follows: In Pair No. 1 the pupil taught by the together method obtained a score of 60 on the Pressey Test while the pupil who was taught by the separate method obtained a score of 58. On the final test, the pupil who was taught by the together method obtained

a score of 40 while the pupil taught by the separate method obtained a score of 28. The reader will note that only thirty-two of the thirty-seven children in this class are represented in Table I. Two of the pairs of children were left out of consideration because one member of each pair failed to take the final test. This caused the dropping of the records of four children from the experimental data. The fifth child was dropped because he was the odd child from the beginning. In other words, he had no partner.

According to Table I the together method gave better test results. The difference between the average performance of the two groups of children was six examples. In twelve of the sixteen pairs of pupils the one who was taught by the together method obtained a higher score than his partner on the final examination.

If we wish to investigate the reliability of the difference between the average performances of the two groups we may do so using the following formula:

$$PE_{diff} = .6745\sqrt{\delta_t^2 + \delta_s^2 - 2r\delta_t\,\delta_s}.$$

In this formula, r is the correlation between the scores of members of each pair on the final test. This r-value is .32; while δ_t—the standard error of the mean of the Together Group—is 2.2, and δ_s—the standard error of the mean of the Separate Group—is 2.6. Substituting these values in the formula we find that the probable error of the difference is 1.89. Thus the difference is a little more than three times its probable error.

TABLE I

THE RESULTS OF TEACHING ADDITION AND SUBTRACTION FACTS TOGETHER AND SEPARATELY AT CENTER NO. 1

PAIR NUMBER	PRELIMINARY TEST		FINAL TEST		DIFFERENCE IN FAVOR OF:	
	Together Group	Separate Group	Together Group	Separate Group	Together Group	Separate Group
(1)	(2)	(3)	(4)	(5)	(6)	(7)
One	60	58	40	28	12	
Two	56	57	40	30	10	
Three	53	50	36	22	14	
Four	48	49	40	38	2	
Five	46	46	22	30		8
Six	43	44	21	39		18
Seven	43	43	36	23	13	
Eight	43	43	23	28		5
Nine	42	41	40	39	1	
Ten	39	40	11	20		9
Eleven	39	37	40	40		
Twelve	34	34	39	22	17	
Thirteen	33	33	23	3	20	
Fourteen	32	31	37	20	17	
Fifteen	27	29	36	23	13	
Sixteen	25	23	27	9	18	
Average	41.4	41.1	31.9	25.9	6.0	

The experiment at other centers.—At Center No. 2, returns were received from only thirteen pairs of pupils. At this center the together method proved to be slightly superior to the separate method. The average of the pupils who were taught the addition and subtraction facts together was 34.5. The corresponding average for those who were taught these facts separately was 32.6.

This yields a difference of only 1.9 and the probable error of this difference is 1.6.

Table II presents a summary of the results secured at all the centers. In general, these data are favorable to the together method of teaching the addition and subtraction facts. In only one instance is the difference between averages favorable to the separate method. This is at Center No. 5. The teaching material used at this center and the final tests based upon it were quite different from those employed at the other centers. The reader will note that the averages for this center are of an entirely different order of magnitude from those obtained at the other centers. Indeed, the irregular character of the procedure at Center No. 5 would have induced us to leave it out of account if it were not for the fact that the data from this center gave the only contrary result.

Two or three of the differences in favor of the together method exceed three times their probable error and thus approach statistical significance. The greatest significance, however, is found in the all but unanimous verdict in favor of the together method. When an experiment conducted seven times yields six results all in the same direction, the evidence is rather conclusive even though some of the differences, when considered individually, are small or lacking in statistical significance. It may be pointed out that the one difference obtained in favor of the separate method is scarcely entitled to consideration at all, especially in view of the fact that it lacks support from any other source. This difference is but little more than one-third of its probable error.

In two important respects this experiment should be supplemented. In the first place, the teaching material consisted of only a few of the two hundred fundamental facts in addition and subtraction. An experiment covering all the facts and lasting approximately one year at each center is much to be desired. In the second place, no testing of retention after a considerable period had elapsed was undertaken in connection with this experiment. By the time the data had been gathered on which this report is rendered, the school year was too far advanced to permit us giving a test of retention.

Nevertheless, for what it is worth the information that we have secured on this question is presented. We cannot avoid the conviction that, in the absence of evidence to the contrary, teachers will be justified in preferring to teach the addition and subtraction facts together rather than separately.

TABLE II

GENERAL SUMMARY

CENTER	NUMBER OF PAIRS OF PUPILS	AVERAGE IN FINAL TEST		DIFFERENCE		PROBABLE ERROR OF DIFFERENCE
		Together	Separate	Together	Separate	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
One	16	31.9	25.9	6.0	.....	1.89
Two	13	34.5	32.6	1.9	.....	1.39
Three	12	40.8	26.5	14.3	.....	3.98
Four	21	37.6	36.5	1.1	.....	0.94
Five	28	144.2	147.8	.....	3.6	10.7
Six	26	27.0	26.5	0.5	.....	2.38
Seven	13	39.6	25.1	14.5	.....	4.18